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ABSTRACT

This paper examines several questions about reflective thinking and its application in education as a way of extending the applications of the concept. An early section offers background on reflection from dictionary definitions and from philosophers such as John Locke and John Dewey. The next section examines educational practice and reflective thinking by tracing the major theories and research in the 1980s and 1990s. The following section explores the nature and definition of reflective thinking in detail including descriptors of the action, and catalysts and topics for reflection. A section on critical thinking and reflection follows and includes discussion of five basic definitions of critical thinking. The next section examines introspection defined as a conceptual companion of reflection that involves a systematic examination of one's own thoughts and thought processes. The next section looks at reflection as a cognitive-developmental activity. The last section deconstructs and constructs a theory of reflection and offers a model that, it is argued, solves some of the difficulties in the preceding sections. In conclusion, it is proposed that the cognitive-developmental explanation and model for reflective processes offered in this paper might demonstrate that reflection is the result of constructions which change because of events or experience, are interdependent and involve prioritization, and may or may not lead to meaningful successive conceptual development unless used as the basis for comprehensive deliberative strategies. Contains 34 references. (JB)

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Through the Looking Glass: Some Criticisms of Reflection

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Overview

Current applications of the term *reflection* have created a culture from which diverse research studies and principles of practice have spread in post-Tower of Babel fashion. Since Shon's (1983) reintroduction in The Reflective Practitioner, the term *reflection* has come to stand as a superordinate concept, subsuming and/or replacing many other sets of understanding about the various activities of the mind. The jargonizing of *reflection* has made a venerable philosophical principle into an overnight success much to the disadvantage of its history, process, understanding and related practices.

We feel that a "trial by alternatives" is one way of achieving a critical reorientation, thus our discussion addresses the following issues:

-What is the background of reflection?;

-What are the current attitudes in educational practice towards the application of reflection?;

-What is the nature and definition of reflection?;

-By what other names and concepts might the processes used to define reflection be known?; and

-How might the process called reflection be depicted?

A Selective Background of Reflection

Reflection is defined in several ways in the Oxford English Dictionary (OED):

> The action of turning (back) or fixing the thoughts on some subject; meditation, deep or serious consideration...recollection or remembrance of a thing...the

> mode, operation *or* faculty by which the mind has knowledge of itself and its operations or by which it deals with the ideas received from sensation and perception. (OED, p. 343)

An example of the latter part of the definition is drawn from John Locke: (circa 1690) "By reflection then...I would be understood to mean that notice which the mind takes of its own operations and the manner of them" (cited in Burtt, 1939, p. 249). Locke's idea that the power of reflection is held by the mind empowers it to "call up from memory several ideas, compare them, arrange them in some logical order, and thence remember that 'imaginary' conclusion" (Hilgard and Bower, 1975, p. 5). Abstraction, inference and deduction were central features of this process and included a culling of accidental and nonessential properties of the event. While Locke assumed that "all such calculations can be carried out in one's head with the faculty of 'reflection' poring over the contents of memory" (p. 6), no provisions for these processes were made except when an explicit question was put to the mind.

Locke regarded statements thus generated as equivalent to actual perceptual inputs from the external world. His empirical-mechanistic doctrine of mind provided a means to free the "mind from being a passive recorder of sequences of sensory impressions" (p. 6). Locke's philosophical application of reflection to mental processes firmly fixed its metaphorical properties in a domain far beyond the mirrored surfaces from which it originated. While an abundance of antecedent examples of use may be found throughout much literature and philosophy, Locke's application stands out remarkably and has much to do with development of the elements that formalised

empirical philosophy (e.g., sensationalism, reductionism, associationism and mechanism).

The influence of Locke's view of reflection on education can be seen directly in the work of John Dewey and his associates during the early 1900's in An introduction to reflective thinking (Columbia Associates in Philosopy (CAP), 1923). The book by CAP, intended as a crossover application for both philosophy and science, included representatives from a variety of faculties (e.g., Philosophy, Theology, Astromony, Mathematics, Zoology, Physics and Law) who provided clear acknowledgement of Dewey and advised prerequisite reading of Dewey's (1910) How we think.

Dewey (1910) put forth the idea that reflective thinking was a better way to think. He defined it as "the kind of thinking that consists of turning a subject over in the mind and giving it serious and consecutive consideration" (p. 3). Dewey differentiated between reflective thinking and the type of thinking characterised by an uncontrolled stream of consciousness which he described as idle and chaotic, and available as a mode of thinking for "silly folk and dullards" (p. 4). Dewey's further definition of reflective thought maintained that it:

> involves not simply a sequence of ideas, but a *con*-sequence-a consecutive ordering in such a way that each determines the next as its proper outcome, while each outcome in turn leans back on, or refers to, its predecessors. The succesive portions of a reflective thought grow out of one another and support one another; they do not come and go in medley. Each phase is a step from something to something-technically speaking, it is a *term* of thought. Each term

> leaves a deposit that is utilized in the next term. The stream or flow becomes a train or chain. There are in any reflective thought definite units that are linked together so that there is a sustained movement to a common end. (pp. 4-5)

Dewey reframed his definition by asserting that: "*Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends* constitutes reflective thought (p. 9). He maintained that reflective thought "*converts action that is merely appetitive, blind and impulsive into intelligent action*" (p. 17).

Historically, at least from the brief foregoing selections, reflective thinking can be defined as a preferred form of thought which may involve a singular focus, or pattern of related foci, of mental activities which are more rigourous and purposive than those which are present in a loosely structured stream of consciousness.

Educational Practice and Reflective Thinking

Zeichner (1994) presented a comprehensive summary and contrasting analysis of the different views of reflective practice in teaching and teacher education. He raised questions about the confusion surrounding reflective practice and whether or not it is a distinct conceptual orientation, and whether or not it is a good thing which should be promoted. He commented on the difficulties and differences which exist between the tasks of wishing to produce reflective teachers and the translation of the principles of reflection into the content of a teacher education program. He also commented on the

vast differences among those who espouse reflective teaching in their conceptions of teaching, learning, schooling and the social order:

> It has come to the point now where the whole range of beliefs about teaching, learning, schooling and the social order have become incorporated into the discourse about reflective practice. Everyone, no matter what his or her ideological orientation, has jumped on the bandwagon at this point, and has committed his or her energies to furthering some version of reflective teaching practice. (p. 9-10)

Zeichner's basic argument concluded that however the concept of reflective practice was intended "to enhance the status of teacher in school reform...(it) has served to undermine and limit the status of teachers and their role" (p. 10) in this process.

Zeichner described the reflective practice movement, through a clarification of different conceptions of reflective practice and the traditions of reflective practice in North America (academic, social efficiency, developmental, social reconstruction, and generic). His arguments and description do much to summarise and locate the debate about reflective practice in a milieu of research and partisanship which extends to most Western educational practices. His views of collaborative efforts acknowledges that certain types of reflective practice want encouragement, as opposed to encouraging further research which seeks only to describe reflective applications. Within this approach, narrative and storytelling, biographies, autobiographies, metaphor analysis, and descriptions of personal constructions all provide ways to avoid isolating teachers "from the social and historical contexts in which their teaching is embedded" (p. 19).

Central to Zeichner's observations and warnings is the need for co-construction, by all participants, of the knowledge-in-action which underlies the reflective process. Vision and voice are both concepts which qualify the reflective process for teachers and bridge personal and professional development if carried out in a like-minded community. MacKinnon and Gruneau (1994) emphasised the necessity of access to like-minded others and described reflection as a function of community and discourse, such as might be sustained in multiple forums, enabling teachers to see their classrooms in different ways thus facilitating their development into professional teachers.

Neufeld and Grimmett (1994) extended the reflective premise by asserting that growth toward a developed professional state can come about through reflection on "the ordinary, day-to-day experience of instructing students in classrooms...(which) elevates the activity of instruction from the level of mundane drudgery to one that has the potential to educate practitioners, thereby changing and improving their practice" (p. 210).

Brookfield (1990) extended reflection by including the provision that "reflective speculation" (p. 63) be attended to by both students and teachers in balance with periods of active engagement in order to *luxuriate* in the ideas of others in the learning process. Handal and Lauvas (1987) included such activities as Brookfield (1990) suggested into the development of a teachers' practical theory; which is a "person's private, integrated but ever-changing system of knowledge, experience and values which is relevant to teaching practice at any particular time" (p. 9).

Practical theories thus explained function as a backdrop "against which action must be seen...and not as a theoretical and logical 'construct' aimed at the scientific purposes of explanation, understanding or prediction" (p. 9). Development of practical theories thus takes into account information from the environment and the sets of information drawn from those experiences. How an individual makes sense of such material depends on choice and opportunity.

As a desirable route to sustaining teacher renewal, Bolin (1987) described *imaginative reflection* as an activity best carried out when detached and "away from the claims and encounters of daily life so that one may reflect on experience" (p. 225). Bolin viewed such an undertaking as a distinctive and necessary activity: "How one will make time for imaginative reflection will be highly individual, as will be the content of such activity...without reflection, there will be no renewal or sustaining of vision" (p. 225).

Reflective activities thus require certain physical or environmental circumstances. Brookfield's (1990) idea of silence as a vehicle for reflection is echoed in Meyers and Jones (1993) suggestion that the "active-learning classroom should include exercises that encourage a healthy dose of quietude and reflection" (p. 29).

The early definitions and qualifications of reflective thinking proposed by Locke and Dewey are thus supplemented by the provision of purposes, approaches, environments, and conditions under which reflection might occur and that to which it might be addressed.

The Nature and Definition of Reflection

Depending on the theorist of choice reflection may or may not require a specific event upon which to be focussed. Where Locke explained reflection in the presence of a specific and explicit question, Dewey called for reflection as a way of thinking. To be a reflective thinker and/or to possess reflective abilities is treated by most, if not all, writers on reflection, as positive states or attributes towards which individuals and organisations might aspire. Such a stance seems to make common sense. Reflective thinking may well be a common, yet unarticulated activity undertaken by uncommonly thoughtful persons.

Most, if not all, of the individual and collective accomplishments of the world community recorded to date might well be products of a process of reflective thought as presently defined. While it would be awkward to support a causal relationship between reflective thought and inventive progress (or even physical survival), a logical relationship seems warranted. The likelihood that an individual is reflectively adept may be a measure of success in any profession or life task requiring deep examination and may relate directly to quality of inner and outer life pursuits.

Reflective thought may also be applied to a variety of circumstances and events in a variety of contexts and temporal frameworks. In the writings of Schon (1983) and Russell and Johnstone (1988) provisions are discussed for both reflection-in-action and reflection-on-action. Reflection-on-action has do to with a post-event apprehension which seeks to resolve a recently experienced issue, problem, or difficulty, or to favourably reflect upon, or savour, an experience. Reflection-in-action refers to a

more immediate set of mental activities pertaining to an event at hand in need of immediate resolution. Reflection thus pertains to events which are short or long term. The foregoing types of reflection (in and on action) may concern events from long ago, as might be expected in a form of life review or autobiographical pursuit, in addition to immediate situational applications.

In addition, the concept of reflection may have as an ancilliary function the dynamic of anticipation. When an event is likely to occur, or is planned to occur, reflective pathways or domains from past encounters of a similar nature may produce a framework from which future events may be anticipated and for which preparations may be made.[1] Thus reflective thought represents a dynamic which can bridge past, present and future activities.

Reflection may also be examined from a perspective of negation, or by imagining its absence. An exaggerated example of a non-reflective individual might depict a state of cognitive inertness, or an individual's failure to respond in any way to the demands of a thoughtful life, and thus cause some be counted among those to whom Dewey (1910) referred as "silly folk and dullards" (p. 4).

Examinations of reflective thought would benefit from consideration as a conceptual dichotomy (i.e., reflective - non-reflective), were associated connotations less pejorative. A non-reflective status might well positively imply domains of spontaneity, creative extemporaneous, or improvisational, thinking. Such a reaction might occur without deliberation as a function of professional artistry in circumstances

[1] See George Kelly's, (1955) Psychology of personal constructs.

where abilities are brought to focus. For example, a teacher in the heat of an active lesson might choose to follow a novel course of events as a situational response without deliberation of any sort. While it might be argued that reflection-in-action can stand as a replacement, or explanatory term for spontaneity and related modes, so might problem solving (for an individual) or brainstorming (for a group) be considered as alternative labels for these processes.

The notion of individual or group reflections produces a dimension of closed *versus* open reflection which must also be considered. If closed reflection is undertaken, then it is assumed that the individual seizes upon some event and turns it around only in his or her own mind, as espoused by Locke and Dewey. As with the earlier reference to Kelly (1955), this activity amounts to a drawing forth of past explanations or constructions of similar events and proceeding to generate alternatives, much in the way that a scientist generates hypotheses. Such an activity causes a re-ordering and psychical "dusting-off" of past processes. While this activity may be of benefit in and of itself, certain advantages (and possibly disadvantages) may be encountered by both staying inside of self, and going outside of self in order to extend ways of thinking about novel and challenging experiences.

Examples of closed *versus* open reflection can be illustrated through a common experience associated with neophyte teachers: one delivers an unsuccessful lesson; another delivers a successful lesson. Neither may be able to make an accurate determination of what has occured (e.g., the unsuccessful neophyte may feel that success was experienced, the successful neophyte may have been convinced that the

lesson was a failure). Through open reflection, or feedback, a more useful determination of event may be made through the addition of an observervational, or external, perspective. The use of student evaluations of teaching, or video-taping (of both class and teacher) are other sources of such information. The outcomes and evaluations drawn from external sets of information may bring about a more informed mode of reflection (which may be more valid and reliable than solitary resolutions or projections of events based on closed reflections). As with other modes of reflective thinking, these processes may or may not lead to action.

Underlying the notion of a reflective status is an internal inconsistency which may be considered in a similar manner to the way in which George Kelly (1955) regarded motivation. Kelly felt that if an individual were alive then he or she were motivated: individual volition thus became the main issue. In similar manner, by virtue of survival or arriving at any place or station in life an individual must be capable of thought, reflective or otherwise, or face extinction and the implied loss of reason and will. Absence of reflective abilities may also represent a pathology of some sort which is another issue altogether.

Reflective thought may be considered as a commonplace process which relates to Kelly's (1955) concept of volition in a manner similar to how fish relate to water: reflective thought is the medium of active psychical existence and growth. The commonplace status of reflection can be reinforced through examination of its usage in practice. When a group of 78 educators were asked to provide a conceptual definitions

of any mental processes which occurred during an activity which involved choosing alternative class processes. Responses included the following descriptors:

ponder	**consider**	**mull over**	**deliberate**	**revolve**
examine	**contemplate**	**meditate**	**reckon**	**inspect**
muse	**spin**	**think about**	**sift**	**probe**
investigate	**explore**	**study**	**look into**	**research**
analyze	**interrogate**	**scrutinize**	**question**	**inquire**
introspect	**cogitate**	**echo**	**ruminate**	**wonder**

Operational definitions of reflection provided by the same teachers included accounts of seeking familiar experiences from past events and using them in addition to current information to project likely outcomes and personal impact. Images of physical activities undertaken while "reflecting" were also deemed to be important (e.g., sitting like Rodin's 'Thinker"; chewing one's lip, pencil etc.; tugging absent-mindedly at hair or beard; squirming; clock-watching, fiddling, fidgeting, doodling, staring off into space etc.). Levels and zones of physical comfort are understood to be important for many learning activities, and are thus not surprising as factors in the context of reflection.

If reflection is a taken-for-granted in the survival and adaptation strategies of the funtioning human, then several questions must be addressed concerning the sources which influence its course and accumulations along the way. The various catalysts and topics for reflection include the following issues:

- unsolicited internal issues such as might be brought on from a change in health, in age, religion and the like;

-external issues arising from such influences as work (changes in practice, career path),

-family (adjustment in status, retirement),

-social change (the postmodernist condition);

-reflection undertaken as a response to an immediate issue, of a more imperative nature than other events in the flow of daily life (a crisis);

-issues which are deflected instead of reflected upon;

-who or what contributes to the stuff of which reflections are made (i.e., is it open or closed?); -frameworks and focusses are general and encompass a wide variety of issues, or they are specific and in-depth pertaining to only a few clearly indentified issues;

-correspondence issues with previous experience and how might a search of that repertoire assist the reflective person in drawing forth tentative solutions or pathways to favourable resolution?

Many of the foregoing issues have been dealt with in a variety of other approaches. For brevity this paper will be limited to those principles and processes which underpin current understanding and application of reflective thinking.

Critical Thinking and Reflection

The central issues in Critical Thinking (CT) demonstrate that reflection may be defined as an aspect of such an approach to thinking. The working definition of the National Council for Excellence in Critical Thinking and Instruction is: "the intellectually disciplined process of actively and skilfully conceptualising, applying, analysing, synthesising or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning or communication as a guide to belief and action" (Binker, 1992, p. 84). Further to this

definition, CT, and thus reflection, are both deliberate processes aimed at sound decision making. CT involves an individual's use of a set of skills that enables her/him to ask probing questions of numerous life experiences in order to problem-solve. In doing so, new sets of standards are created and thus new parameters for thought and behaviour, in addition to the reconfiguration of previous knowledge, are carried out through critical evaluation during a reflective phase. Clearly defining critical thinking creates minor difficulties as it has been neglected for a number of years but has recently become "a hot topic" for researchers and practitioners (Johnson, 1992). Five basic definitions may be considered:

1. Ennis' (1987) definition of critical thinking as "reasonable, reflective thinking that is focused on deciding what to think or do";
2. McPeck's (1981) definition of critical thinking as "the skill and propensity to engage in an activity with reflective scepticism";
3. Richard Paul's (1982) definition of critical thinking as essentially dialogical and distinguished from weak sense. More recently (1989) he has offered a definition of critical thinking in terms of perfection and traits of thought: "Critical thinking is disciplined, self-directed thinking which exemplifies the perfection of thinking appropriate to a particular mode or domain of thinking" (p. 214);
4. Lipman's (1988) account of critical thinking as "skilful, responsible thinking that facilitates good judgement because it; (a) relies upon criteria; (b) is self-correcting and (c) is sensitive to context.
5. Siegal's (1988) definition of the critical thinker refers to the individual who is appropriately moved by reasons.

While these definitions overlap, there are variations among them. For example, Ennis' definition equates critical thinking with rational thinking. Further examination shows that

there are connections between critical thinking, creative thinking and problem solving. "Critical thinking" belongs to a network of terms including problem solving, decision making, metacognition, rationality, rational thinking, reasoning, knowledge and intelligence. Sorting out these relationships precedes adequate definition in addition to the question of whether or not any definition should extend to both realms of action and belief.

Paul's (1982) definition invites speculation on the extent to which critical thought depends on the capacity of the individual to become aware of egocentric and ethnocentric thinking and the tendency to self-deception. His tendency to attach a moral dimension to critical thinking indicates a possible connection between critical thinking and morality and moral theory. Although action is not speculated upon, the rightness and wrongness and blameworthiness or praiseworthiness of deeds initiated by a critical assessment might also want consideration as to whether or not there should be a moral component to critical thinking and by association; reflective thinking.

McPeck, like Ennis and Siegal, included actions as well as beliefs, but the negative connotation in the term "reflective scepticism" is considered by Johnson (1992) to interfere with the advancement of critical thinking as an educational and pedagogical ideal. Lipman (1988) used scientific and logical thinking to define critical thinking. There is some agreement on the inclusion of action as a component part of critical thinking which would have little point unless there is an action following the process, or an action as part of the process. This notion of action being an integral part of critical thinking is supported by Bailin, Case, Coombs and Daniels (1994) who stated that:

> Critical thinking involves thinking through problematic situations about what to believe or how to act where the thinker intends, to some extent succeeds, in making reasoned judgements that embody the attributes of a quality thinker. (p. 1)

Bailin et al. also proposed three dimensions of critical thinking. First, they addressed the critical challenges which dealt with the tasks, questions or problematic situations that provide the impetus and context for critical thinking. Second, were the intellectual resources which have to do with the background knowledge and critical attributes - the array of knowledge strategies and attitudes required for quality thinking - that are drawn upon when responding to critical challenges. And third, were the critically thoughtful responses to particular critical challenges that demonstrate appropriate use of the relevant intellectual resources. In other words, the relationship among the dimensions means that, to think critically is to respond thoughtfully to a particular challenge by making use of the appropriate intellectual choices. However, by summarising critical thinking in this way, the nuances associated with definitions from the preceding scholars are lost, or at least obscured, indicating the complexity of the processes involved.

Critical thinking has a reflective nature. Schon's (1983, 1987) expressions "reflective" and "reflection" described a specific process to assist in problem solving as a means of increasing professional competence and efficiency. According to Schon, while the contexts are markedly different, the process is the same, namely that individuals examine the process by which a desirable state of functioning may be achieved. By the careful examination of issues at hand and the determination of specific goals, a step-by-step procedure is developed by which individuals may then trace or retrace steps and thus

determine points in the process which have either led to problems, or may prevent their occurrence. Schon's approach is aimed at developing or improving the "art" of a craft or profession through the process of reflection. What he suggests is part of a larger entity, in this case, critical thinking. While he perceives reflection as something which is, or may be, taught, a background is lacking as are sufficient contrasts with other approaches. Schon does refer to the importance and uses of introspection, intuition and knowing as a means of problem-solving.

However, his focus on reflection as the key of the process is only one of the constituents of critical thinking as identified by Johnson, Ennis, McPeck, Paul, Lipman, Siegal and Bailin et al. Schon does not acknowledges the range of knowledge and personal baggage which individuals bring into situations and which influence, and indeed may help develop, the range of their individual perspectives and processes.

According to Reinhart[2] (1994):

> We reflect, evaluate, or do critical thinking because on a daily basis we must make choices about how we will react to what we hear, see and experience. If we react passively, we make the opinions of others our own. If we react actively, we ask questions of ourselves to reach our own conclusions. CT is an attitude as well as a set of teachable skills. Critical thinking is an awareness that there are, at all times and on all occasions, a set of critical interrelated questions that persons have the ability to ask...we can choose to actively use them and acquire knowledge through an active critical process.

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[2] The contribution of Ernest Reinhart and the Society of Thinkers in Ridgeway, Ontario, Canada is acknowledged for this summary.

Reflection, in the context of critical thinking, can be seen as part of the process of interrogating information for meaning and direction. The alternative (i.e., to not think critically) means unquestioned acceptance of the ideas, opinions and syntheses of others.

Introspection and Reflection

Introspection is a conceptual companion of reflection in that it involves a systematic examination of one's own thoughts and thought processes. Wundt[3] (circa 1860), a pioneer of the use of introspection in psychology, brought the innovation of precise experimental control over the conditions of introspection. The underlying intent of many of Wundt's experiments involved reporting on a observation made of one's own internal condition. Wundt tended to ignore the qualitative description of inner experience as part of his search for the elements of conscious experience. His interests were with how elements were organized and the nature of any laws governing their organization. More recent treatments and uses of the concept of introspection have found it to focus on that which Wundt ignored (i.e., qualitative elements and reports). This movement brings its connotation closer to that of reflective thinking in that the goals of understanding and using mental phenomena to better understand an issue both seek to synthesize and capture elements of knowledge, and processes of knowing. .

Some theorists (e.g., Natsoulas, 1991) have described aspects of introspection as involving "adoption of a certain mental set, an 'introspective' attitude" (p. 45)

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[3] See Schultz, D.P. & Schultz S.E. (1992). A history of modern psychology. (5th Ed.). New York: Harcourt, Brace Jovanovich, for contextual presentation of the early introspectionist movement.

which may be extended to metaphorical visual activities (e.g., "noticing the perspective of things...viewing the world in perspective...reflective seeing" p. 45). Two levels of introspection are described which consist of ordinary thinking and introspecting on one's own stream of thought. Introspection is especially concerned with "thoughts, feelings, emotions, intentions, perceptual experiences, and other particular states of consciousness" (p. 46).

Much of the critique of introspection has been carried out within the principles of experimental psychology and falls into three broad categories. The first has to do with an objection in principle "that introspection simply does not exist-it is a myth or collective illusion" (Howe, 1991, p. 29). The second criticism has to do with objections in practice, in that the results of introspection are unreliable and never agreed upon by different observers. The third criticism has to do with "the problematic *nature* of introspection, and include problems stemming from the *interference* of the observer with the observed; the *privacy* (e.g., lack of replicability, lack of verifiability and the ineffable nature of mental events for communication) of mental phenomena; and the *unavailability* of certain sorts of data" (p. 29).

Combs, Richards and Richards (1976) described the difficulties with introspection "when, in trying to understand the self of another, we ask a person how he sees himself, his reply is not a description of his phenonemal self, but rather a self-report" (p. 373). While self-reports are of some use they are not the same as the phenomenal self, as the former is is a behaviour and the latter is a perceptual organization. Whether or not expressions or measurements of reflections would

constitute more or less than self-report behaviours would have much bearing on the trustworthiness of maaterials so elicited. The current interest in biography, narrative, journalling and storytelling, while representing knowledge and insight, are important in ways that individual meaning varies, much to the advantage of the teller and the told. As devices of disclosure and personal use, the foregoing approaches are valuable and revealing. As the only documentation available for inference into the important aspects of individual lives, the use of reflective disclosures as sources of knowledge must be questioned for risks and ethical considerations to the discloser beyond the subjective (dis)advantages of content analysis using traditional methods and methodologies.

The foregoing criticisms of introspection, may be applied with equal measure to the tenets of reflection and used to consider the inherent difficulties in applying rigourous and traditional (or contemporary) analytic methods in search of predictable outcomes and relationships. However, the attentions to the qualitative aspects of the products of both introspective and reflective thinking bring both to the same set of defenses which support self-determinism and autonomy in thinking persons without being hoist by objectivity.

Should studies be undertaken to determine the measurable essence of reflection, it seems that similar problems and criticisms as were applied to introspection would also be present. Within these criticisms lie the difficulties of separating the process and product of reflection in a distinct way. Semantically the word reflection involves many of the aforementioned activities and processes. The products, or those elements of of

reflection which are self-reported (or other reported), are versions of materials thus generated and represent approximations of inner processes.

Reflection as a Cognitive-Developmental Activity

The foregoing accounts and comparisons illustrate that the philosophical and practical applications of the idea of reflection have been, and are, known by many different names. Further to this, it seems that something, some process of mental activities, does indeed occur which leads to an amalgam of carefully considered invisible elements which may or may not lead to action. The posing of dynamics which might be used to account for, or characterize, the reflective process may be of use in further marking the reflective domain. While a host of other theorists may be used to provide plausible accounts of how reflection occurs, we have chosen to focus on the overlapping structures provided by Piaget (1953), Kelly (1955) and Kuhn (1970)[4].

Reflection, in its essence, is concerned with adaptation to circumstances and information as a way of leading to successful outcomes. Piaget (1953) argued that biological and intellectual adaptation requires organisation. The schema, as a fundamental unit of organisation, is derived from experience and produces a unified pattern of behaviour. Adaptation is facilitated by by the complementary processes of assimilation and accommodation. Assimilation integrates environmental influences into an already-existing physical or cognitive structure thereby extending existing schemata. Accommodation alters physical or cognitive structures having to do with new patterns

[4] Nystrand's (1977) analysis of how these theorists connect provided a basis for this section

of behaviour. Piaget's notions contain features for a universal cognitive development in that there are "all sorts of schemata, from primitive sucking and grasping...to the more sophisticated verbal and conceptual ones, each being an organizational structure for a particular aspect of experience" (Nystrand, 1977, p. 6).

Meyers and Jones (1993) used Piaget's concept of equilibrium and disequilibrium and the inherent challenges of such movement to argue a case for the importance of reflective opportunties for integration and appropriation of new knowledge. Kagan (1982) linked a child's movement from "being my action-sensations to having them" as creating a new subjectivity: "In 'having them' they are integrated into a more articulated psychologic. That new structure-which, in being able to *reflect on* sensations and actions, is able to distinguish between a me and a not-me" (p. 31). The aquisition of reflective abilities thus relate to developmental maturity, but also relates to the evolving definition of self.

Kelly's (1955) notion of constructing personal reality complements Piaget in that conceptions of reality are ordered through categorization of personal constructs for the purpose of successful anticipation of experience. In this respect the schema and the construct are parallel units of experience. Kelly's metaphor of "person-as-scientist" included five phases: anticipation (experiences are loaded with expectations drawn from prior constructions); investment (applying the construction to an event); encounter (actual experience because of investment); confirmation/disconfirmation (of anticipations and expectations); and constructive revision (in light of confirmation or

disconfirmation). Within Kelly's approach the dynamics of confrontation and reflection serve a therapeutic purpose in problem analysis and resolution (Winter, 1992)

Kuhn's (1970) ideas of scientific revolutions connect and elaborate Piaget and Kelly through the organisational unit of the paradigm, a device which assists focus and depth of perspective. According to Kuhn, the processes experienced by scientists seeking to establish a more coherent and organised understanding of scientific reality undergo a process of: establishment of paradigm; articulation of paradigm; experimentation guided by paradigm; confirmation or disconfirmation of the paradigmatic prediction; and paradigm replacement (constructive revision). Kuhn described how the process of scientific discovery was completed through the detection of anomalies which stand out from the anticipated and the usual. Study of that anomaly raises awareness that something is out of place or wrong, or relates to something that was out of place or wrong before. He concludes: "That awareness of anomaly opens a period in which conceptual categories are adjusted until the initially anomalous has become the anticipated...that process or one very much like it is involved in the emergence of all fundamental scientific novelties" (p. 64).

Both Kelly's and Kuhn's frameworks are cyclical, in that each continues to evolve and elaborate. Schemas, constructs and paradigms "undergo assimilation and accomodation; elaboration and reconstruction; or investigation, crisis and revolution. Each may be looked on as an essential participant in a fluid, ongoing process of development involving a personal commitment and tension between individual and world...a contextual web" (Nystrand, 1976, p. 9).

Reflection implies that processes of some sort occur, visible through the effects of observable outcomes, or reports of observable outcomes. Piaget, Kelly and Kuhn provided the basis for a cognitive-developmental model of reflection. The conjunction of these three theories has much to do with short and long term development and change as the overlapping language and processes indicate. While changes may be rapid, they may also be prolonged; as happens with the aging process.

The issue of whether or not reflective thought becomes enhanced with age and/or practice is relevant to Dewy's (1910) analysis, as he espoused that the processes be taught at an early age to ensure viable development in later learnings. Related issues of wisdom and knowledge as aquired through accumulated experience and understood through reflective processes likely varies between and among individual cultures, gender, learning, and professional background.

(De)Constructing the Reflective Process

Because of the elemental connections in the propositions offered by Piaget, Kelly and Kuhn, their offerings are theoretical constructions. In this context, we mean "construction" in two ways. First, the theorists posit logical, integrated and developing systems as a way of explaining biological, cognitive, personal and scientific development. Second, these theories are constructed in that they represent individual conceptions and models which interpret the experienced reality of developing persons and systems of thought (a constructed constructivist perspective?).

From this perspective we offer a model (see Figure 1.) which for us solves some of the difficulties put forth in the preceding sections, but also leaves residual problems which permeate any interest in human thought processes: direct access to mental processes.

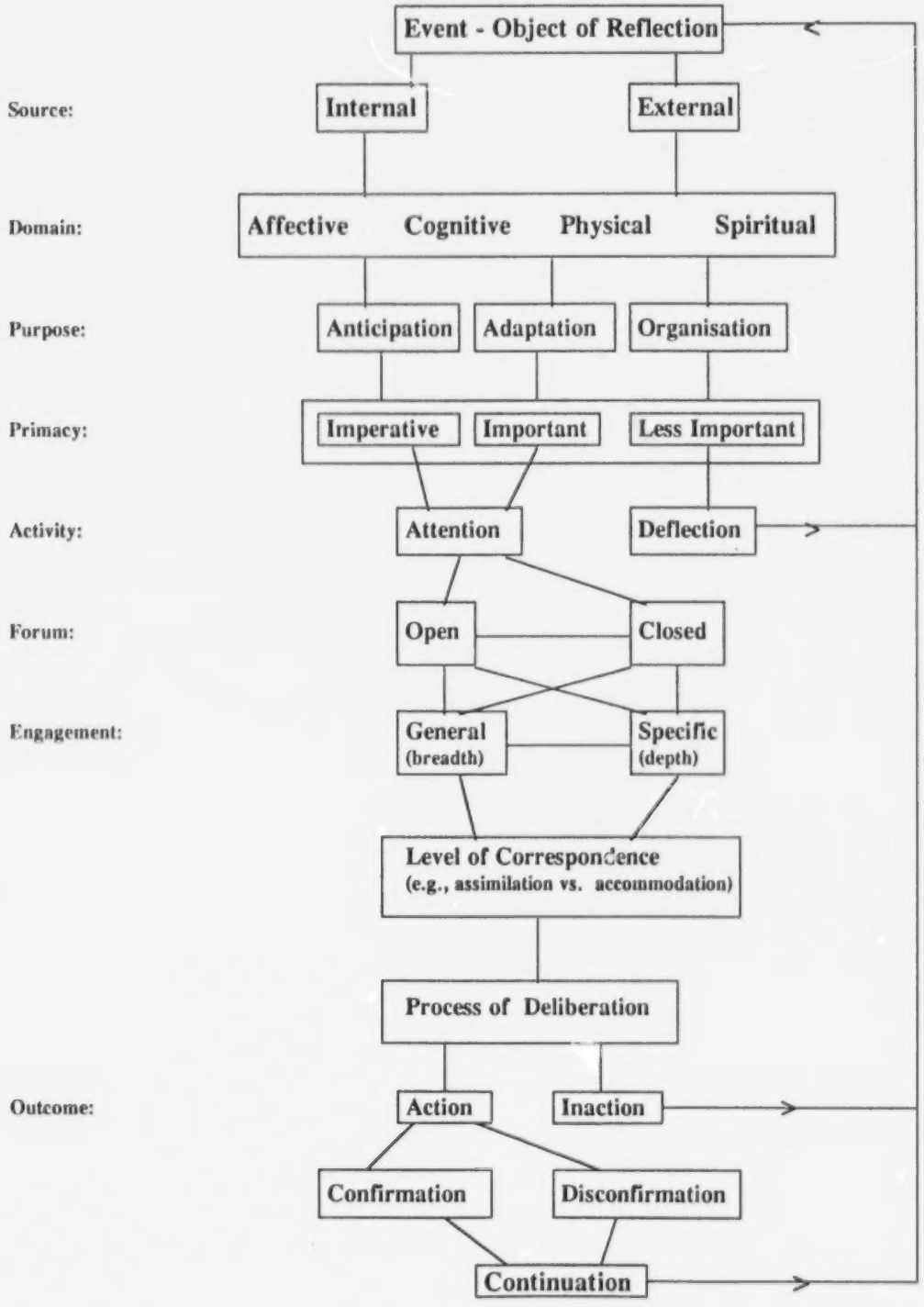
Insert Figure 1. about here

The Model

Events, or **Objects of Reflection** are labels to depict occurrences (single, multiple or interrelated combinations) which cause the thought processes to become active and focused and want some level of attention. These events may arise from **Internal** or **External** sources, or a combination of both. Examples of internal include aging, or spiritual awakening, external events pertain to those events which originate from outside of self (e.g., a car accident, or implementing a new curriculum - both of these examples could have possible overlap and give rise to further internal or external events).

Events may relate to a specific domain (e.g., including but not limited to: **Affective, Cognitive, Physical, or Spiritual**) or may overlap from one domain to another. In the example of the car accident, a physical response may be the initial domain which is influenced, followed, or joined by other domains of influence as seriousness and implications are considered.

Figure 1. The Construction of Reflection



Events are laden with purpose which may be antecedent to the event or arise as a consequence of the event. According to Kelly (1955), persons attempt to **anticipate** events; according to Piaget (1953) persons encounter events and view them as **adaptive** challenges which want **organisation** in order to assist development; according to Kuhn (1970) events occur as and provide opportunities of extending normal science.

Events may be considered as having a sense of primacy about them. Humans swim in a sea of events, many of which are deemed as **less important** and not wanting immediate attention. A few of these events may be deemed to be **important** having some sense of urgency attached to them. Still fewer events would have the label **imperative** attached to them and demand immediate attention. Such prioritization of events determines an order of event resolution. It is likely that more than one eventmight be dealt with at the same time, or that the resolution of one event might contribute to the resolution of another.

Depending on the priority attached to an event, it may be chosen for **attention**, which may involve reflection, introspection, critical thinking or any other set of mental activities. Should events not be of sufficient priority, they may be **deflected** for attention at another time.

Once an event is chosen for attention, the forum for providing that attention may be **open** or **closed**. Open attention would involve input from external sources to the event including the opinions of others through feedback or brainstorming while closed attention implies a more solitary way of engaging the event. The focus of the

event engagement may be general (e.g., with a life or experiential review) or specific (e.g., choosing a wine). Both forms of engagement involve searching for some level of correspondence in existing schemas, constructs or paradigmatic structures to determine its familiar or anomalous status. Piaget's dynamic of assimilation and accommodation help to explain the implications of high or low levels of event correspondence.

The most vague part of this model, and related theoretical areas, has to do with **the process of deliberation**. When an event is actually considered for resolution, no direct access to these process can be had, such was the failure of pure introspectionism: as is the likely experimental failure of examining reflective thinking. Whether rational, irrational or intuitive, only labels can be used to describe self report which is interesting but not conclusive or comparable.

Conclusions about events are visible as **actions** or **inactions** resulting from any deliberation. Should action occur, the outcome (successful or unsuccessful) indicates whether or not the chaining of activities and processing of the event are to be **confirmed** as strategies likely to be used again, or **disconfirmed** and not used again. Thus the construing person **continues** on to a new or previously deflected event.

While a model of this simplicity is not intended to pose a solution for the problems inherent in reflective or other types of thought, it is useful for looking at the associated dynamics for the purposes of deconstructing the process should disconfirmations occur. The model also is used to view reflection and reflective thinking as it is currently applied as a constituent part of processes which have been long examined and about which much is yet unknown. Support for meaningful

research into reflective thinking as it might be understood in a more conceptually and historically integrated way is available through consideration of the contexts and contents of the broader domains represented in other fields of inquiry.

Summary

We set out to answer several questions about reflection (What is the background of reflection?; What are the current attitudes in educational practice towards reflective thinking?; What is the nature and definition of reflection?; By what other names and concepts might we know the processes used to define reflection?; and How might the process called reflection be depicted?) as a way of extending theoretical, experimental and practical applications of the concept. While such a critique as this is not intended to be comprehensive or exhaustive, we feel we have identified certain weaknesses in current applications of reflective thinking.

There is a long history to the concept which assists elaboration of the term and provides firm grounding in philosophy (e.g., Locke and Dewey). Reflective thinking adds to how we understand the processes of teachers and other professionals, but can provide constraints and disadvantages depending on its domains of influence and whether or not it is a co-construction which represents reflective practice as opposed to descriptions of reflective practice (Zeichner, 1994). Reflection permeates the psychical world of the thinking human and is evident as a cognitive strategy in various forms. Reflection is also a practical undertaking which has many other names when its

operations are described. That the process goes on and leads to some outcome seems to be more important that what it is called.

The body of literature which surrounds Critical Thinking grounds reflection as but one aspect of a larger approach which seeks to understand the operations and principles of deliberative mental processes. Introspection resides in a domain similar to reflection in that its principles were elusive when subjected to experimental analysis. While much research has focused on process and outcomes, fewer such endeavours may be counted which address the dynamics of reflection. This shortcoming has to do with the issue of direct access to mental processes and creates limitations which can only be dealt with through inference or attribution.

Schon's (1983) approach to an epistemology of practice, while providing a basis for inquiry, falls short in that he espouses application of principles rather than an understanding of how these principles operate to produce knowledge. By proposing a cognitive-developmental explanation and model for reflective processes, we hoped to demonstrate that reflection is the result of constructions which: change because of events or experience; are interdependent and involve prioritization; and which may or may not lead to meaningful successive conceptual development unless used as the basis for comprehensive deliberative strategies. Reflection may be little more than a contemporary label for an aspect of human thinking processes whose popularity has exceeded its conceptual and theoretical grasp.

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